

Lesson topic: WATER POLLUTION, a study in the effect of human actions on sea life.

Learning Goals	
Essential Questions <ul style="list-style-type: none"> How do our actions (polluting) directly affect plants, animals, and humans on earth? What can we do to protect the earth from pollution? 	Understandings/Big Ideas <ul style="list-style-type: none"> Human actions affect the environment: specifically, sea life Pollution of the sea affects plants, animals, and humans.
Know[ledge] <ul style="list-style-type: none"> Definition of pollution: The introduction of harmful substances or products into the environment (e.g., water sources) Examples of water pollution, causes of water pollution, and effects of pollution 	Skills (Do) <ul style="list-style-type: none"> Identify specific ways in which we pollute our waters. Come up with ways in which we can minimize our impact on our waters—and therefore all of the earth.

Lesson Sequence
<ol style="list-style-type: none"> Hook. Tell students that today you’re going to begin with a little experiment. Call a student to the front of the room. Prompt this student to hold her hand out and pretend it’s a fish. Use plastic rings (from a six-pack of soda) and olive oil to simulate some of the effects of pollution on sea life. Ask the class, “What are we seeing? Who or what are the causes of what’s happening to the fish?” (Pollution, humans) Vocabulary. Pose, “What is pollution? What does that word mean?” Have students turn & talk to a neighbor to discuss what they think pollution means. Take 1-2 responses. Write a definition of pollution on the board. Read-Aloud. Share real-life example in “One Oily Mess.” Ask students to listen for what <i>caused</i> the pollution in this story, and what the <i>effects</i> of the pollution were. Read the story. Then have students turn & talk to share what cause/effect they heard. Take responses and record them on a simple t-chart on the board. Modeling. Distribute the graphic organizer. Prompt students to record the definition of pollution at the top. Model writing one thing in each column, with student assistance. Have students record the model as you write. Differentiated Readings. Tell students that they will be looking at different resources to find out more about the causes and effects of water pollution. Display the groupings/partners and assigned readings. <ul style="list-style-type: none"> <u>Emergent 1 (Green Paper)</u> <ul style="list-style-type: none"> Excerpt from <i>Cry Out: An Illustrated Guide to What you Can do to Save the Earth</i> – Simple reading level, vivid pictures <u>Emergent 2 (Orange Paper)</u> <ul style="list-style-type: none"> <i>Clean Water Program</i> (online resource, City of Oceanside) – Follows a question/answer

format; information broken into chunks, but multi-layered

- Grade-Level (Blue Paper)
 - *Officer Snook vs. The Pollution Monster* – Comic strip; information is less obvious, more inference required.
- Advanced (Yellow) – *Science Weekly: Ocean Pollution* – Article written for teachers, somewhat dense.

OPTIONAL: Display an agenda to guide the students' work. For example:

- Read your resource silently.
 - Use the graphic organizer to gather information about the causes and effects of water pollution.
 - When your partner/group members finish, share what you found with them. Work together to complete your organizers.
6. **Mixed-Readings Groups.** Tell students to find 1-2 other people who did NOT read the same resource. (Different readings are on different-colored paper.) Prompt them to share their findings, in turn. Students should add to/revise their organizers based on what they hear from their peer(s). Circle the room as the students share. Use a blank version of the organizer to gather student responses and record them on your model in the front of the room.
7. **Synthesis.** Direct students to the model that you've expanded with their responses. Review the information in each column. Ask students to take a minute to review the model and see if they would add anything that is not already represented. After making any additions, consider asking students to see what relationships they see between the causes and effects of water pollution, or what questions the information that they gathered raises.
8. **Problem-Solving.** Have students work alone or together to complete the second page of the organizer (How can humans reduce the causes and lessen the effects of water pollution?) Share ideas in whole-group. *Note:* Consider using a new student grouping for this step.
9. **Application Performance Task.** All students work individually on this task in order to make sense of and apply what they've learned:

You are fish who lives in polluted waters. You're going to Washington, D.C., on behalf of your fellow fish to speak to members of Congress. Your goal is to write a speech that will convince them to make laws that will reduce water pollution. To do this, you will try to get them to understand the causes and effects of what pollution, and what can be done about it.

Your speech must refer to at least

- two sources of water pollution
- three ways this pollution is affecting water life (e.g., fish, plant life, coral reefs, the ecosystem)
- three ways this pollution is affecting humans
- two things humans can do to minimize water pollution